NON-PHARMACOLOGICAL INTERVENTIONS IN THE CONTROL OF URINARY INCONTINENCE AND THE INSTRUMENTS THAT ALLOW THE DIAGNOSIS: INTEGRATIVE REVIEW

Intervenções não farmacológicas no controle da incontinência urinária e os instrumentos que permitam o seu diagnóstico: revisão integrativa

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Abstract

Introduction: Urinary incontinence is a major health problem resulting in physical, psychological and social changes with economic repercussions on the health system. Is a multifactorial condition associated with age-related changes and disorders of the genitourinary system, which corroborates the fact that it is the most often recurring geriatric syndrome.

Aims: To identify non-pharmacological interventions for adults with urinary incontinence and to identify tools for urinary incontinence diagnosis in adults.

Method: An integrative review study design was completed. Two electronic databases was search (MEDLINE and Web of Science). Three independent reviewers searched databases according to a predetermine inclusion and exclusion criteria.

Results: Twelve articles were included in the review. Eleven articles mentioned non-pharmacological interventions, such as physical therapies, lifestyle strategies, behavioural therapies and alternative conservative management options. These interventions should be targeted and individualized to the type of incontinence to result in health gains for the population. One article mentioned an assessment tool for urinary incontinence - The Gaudenz-Fragebogen tool. The evaluation tools can help to systematize the diagnostic activity and consequently improve the clinical practice in the field of urinary incontinence.

Conclusion: In care conception, nurses should target their interventions to personal data to address individual symptoms and use assessment tools that can help in the differential diagnosis of UI. Then, to advancing the quality and rigor of nursing care, we advocate that providing nurses with skills in attaining a differential diagnosis of UI presents an added value to the improvement of quality of care in a multidisciplinary context.

KEYWORDS: **NURSING PRACTICAL; URINARY INCONTINENCE; NURSING CARE; ASSESSMENT INSTRUMENTS.**

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INTRODUCTION

Urinary incontinence (UI) is a major health problem resulting in physical, psychological and social changes [1] with economic repercussions on the health system [2].
As a symptom, UI is defined as any involuntary loss of urine independent of the volume, and as a sign represents involuntary loss of urine, either urethral or extra urethral during gynaecologic examination [3].
Is a multifactorial condition associated with age-related changes and disorders of the genitourinary system [3], which corroborates the fact that it is the most often recurring geriatric syndrome [4] and is often the cause of elderly institutionalization [5].
From the epidemiological point of view, UI is two to three times more common in woman [6] and affected 200 million people worldwide [3]. However, UI data are variable, justified by the feelings of embarrassment, which are often the reason individuals do not disclose the disease [2].
Research point out the impact of UI on the performance of daily activities, namely, limitation of amount of liquids ingested, schedule for urinary elimination, selection of appropriate clothes, adaptation of leisure activities and also effect on sexual activity [7]. All these activities are in the self-care domain and thus in the field of nursing and specifically in the field of autonomous nursing interventions. In different contexts, nurses are the professional group responsible for the differential diagnosis of UI and for defining interventions that promote self-management of urinary incontinence. Therefore, nurses have an active role in preventing and management UI [7].
However, few studies report nursing concerns about diagnosing urinary incontinence and concerns on effective interventions for controlling leakage. Although, several risk factors for urinary incontinence are described in the literature. In particular, for the diagnosis of stress urinary incontinence, there are several competing factors, including post menopause, multiparity, vaginal births, age, chronic cough, pelvic surgery, obesity, abrupt fluctuations of weight and radiotherapy [8]. For urge incontinence, the factors that can compete with the diagnosis are urinary tract infections, abdominal and pelvic tumours, neuropathies (diabetes), long periods of bladder catheterization, use of sedatives and diuretics, advanced age, presence of stones in the bladder or urethra, stroke and excessive consumption of coffee and alcohol [9]. Similarly, factors that contribute to the functional incontinence could be confusion, dementia, impairment mobility, diseases such as Parkinson's and stroke, architectural barriers, advanced age, unknown environments, side effects of certain drugs such as sedatives, sleep inducers, diuretics, and muscle relaxants [9]. Finally, for reflex incontinence, a potential competing diagnosis is spinal cord injury [10]. Thus, when developing care plans, nurses should target their interventions to personal data to correct symptoms and use assessment tools to help in the differential diagnosis of UI.
After the above and with the concern in evidence-based nursing, the theoretical and practical implications of the study are justified by the need to objectify the conception of nursing care in the field of urinary incontinence, specifically, in the differential diagnosis of urinary incontinence and appropriate interventions. So, the aim of this integrative review was to identify non-pharmacological interventions for adults with urinary incontinence and to identify tools for urinary incontinence diagnosis in adults.

METHODS

An integrative review study design was completed. Integrative review refers to a study method that permits the inclusion of different methodologies, such as experimental and non-experimental studies, in order to fully understand the phenomenon in study [11].
For any review method a clear and reliable research question, is the first stage of study. Thus, our research questions was *"What are the non-pharmacological interventions for adults with urinary incontinence?" and "What are the assessment tools for diagnostic of urinary incontinence in adults?"*
We searched in EBSCOhost (CINHAL complete and MEDLINE Complete) and Web of Science,. For articles identification, we use search terms indexed to databases (Medical Subject Headings). The search terms were (diagnoses OR diagnosis OR therapeutic* OR assessment OR intervention* OR evaluation) AND nurs* AND ("urinary incontinence" OR "urinary disorder*" OR "bladder condition*" OR "stress incontinence" OR "urge incontinence") AND (validation OR questionnaire* OR scale*).
The inclusion criteria used were full text available in English, with adults' subjects, in hospital or community setting. Experimental, quasi-experimental, non-experimental, methodological and qualitative studies design were also included. However, focus studies (sample) on pregnancy and prostatectomy have been excluded, since the non-pharmacological interventions used alone cannot be effective [12], given the specificity of each of the situations.

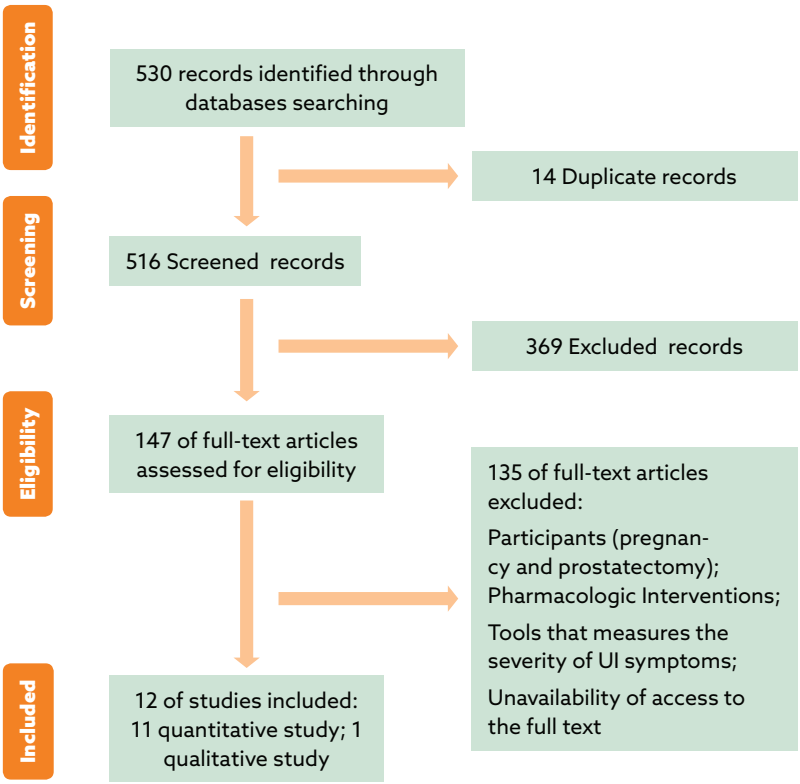
To ensure the accuracy of the method and the accuracy of the results three reviewers independently conducted research. The reading of the title, the abstract and the complete text was the sequence used to select the articles and the consequent inclusion in the sample.

From the review, we identified 530 articles and 14 were eliminated by duplication. Five hundred and sixteen were eligible articles, which, after independent analysis of researchers and application of the inclusion criteria were discarded 369 articles. Of the 147 remaining articles were still eliminated 135 due to participants sample (pregnancy and prostatectomy), unavailability of access to the full text, pharmacologic interventions and tools that measures the severity of UI symptoms. Lastly, twelve articles were included. The review process is represented in the PRISMA flow diagram [13] **(Figure 1).**

To classify the levels of evidence the guidelines of the Registered Nurses Association of Ontario [14] were applied. Finally, for data collection, we used the Ursi instrument presented by Souza, Silva, & Carvalho [15], which allowed for systematic organization of the information and assisted the processing and interpretation of the data.

FIGURE 1

PRISMA FLOW DIAGRAM: NURSING DIAGNOSIS AND INTERVENTIONS FOR ADULTS WITH URINARY INCONTINENCE



RESULTS

The 12 included articles represented 2602 participants. The sample size ranged from a minimum of 30 participants to a maximum of 1474. Regarding sex, we found that female-only samples represented seven articles, three articles were mixed samples, and two articles used a nursing staff sample. For study design, we found four experimental studies, five non-experimental studies, one quasi-experimental study, one methodological and one qualitative studies. Regarding the country of origin, most studies were developed in the USA (six). The remaining six studies were conducted in Turkey, New Zealand, Korea, Spain, Brazil and Sweden. Regarding the setting of the study, most studies (nine) were implemented in the community, and three studies occurred in the hospital context.

The levels of evidence were classified according to the criteria of the RNAO [14], and more than half of the studies used evidence obtained from well-designed non-experimental descriptive studies. The studies are summarized in **Table 1.**

To enhance the rigour of results presentation, they are provide in accordance with the research questions:

3.1 First question: *"What are the non-pharmacological interventions for adults with urinary incontinence?"*

Of the 12 articles, 11 mentioned non-pharmacological interventions. Of these, two studies were implemented in the hospital [16, 17] and the others were in the community setting [2, 18-25].

The non-pharmacological interventions identified, have focus on reducing the severity of symptoms of urinary incontinence and their impact on quality of life [2, 19, 24]. The severity of the symptoms are operationalized through severity of urine loss, the number of episodes of urine loss and the intervals between voiding [17, 22, 24, 25].

The non-pharmacological interventions found can be grouped into physical therapies (pelvic floor muscle training); lifestyle strategies (behavioral management); behavioral therapies (bladder training, prompted voiding) and alternative conservative options (absorvent products and diapers).

About physical therapies, the findings showed that the interventions that often prescribed and described as effective for controlling involuntary loss of urine were pelvic floor muscle exercises [2, 16, 17, 19, 20, 22, 25].
Continuous practice of pelvic floor muscle exercises (for 6 to 12 months) influenced the quality of life of women with urinary incontinence, reduced the number of involuntary urine loss episodes and increased the muscle strength of the pelvic floor [2, 17, 19, 22, 25].
The lifestyle strategies found referred to reducing caffeine intake, regulating the amount and timing of fluid intake, promoting bowel regularity through dietary changes and weight loss [17, 22].
The behavioral therapies included a bladder training and prompted voiding. The bladder training was a simple non invasive intervention that improved the effectiveness of behavioural techniques for bladder function and improved comfort [16-18, 20, 24], the prompted voiding proved to be an effective intervention in self-management of urinary incontinence, contributing to fewer visits to the toilet [18]. One study also pointed to the importance of a therapeutic combination in controlling involuntary loss of urine, namely pelvic floor muscles exercices and bladder training [19]. Finally, the alternative conservative options included the absovents products, urinals and toileting aids by diapers [23].
In summary, the non-pharmacological interventions for adults with urinary incontinence found, such physical therapies, lifestyle strategies, behavioral therapies and alternative conservative management options proved to be effective in decreasing episodes of urine loss and improving quality of life [22, 24].
However, sustaining pelvic floor muscles exercises was not always easy, especially for older people, who believed that their urinary incontinence was due to age and physical condition [21].

3.2 Second question: *"What are the assessment tools for urinary incontinence diagnosis in adults?"*
Of the 12 articles, only one article of the tools responds to the research question, the Gaudenz-Fragebogen tool. This instrument establishes a differential diagnosis of female urinary incontinence [26]. This tool is constituted by 16 questions with dichotomous responses and generates two final scores for stress urinary incontinence and urge urinary incontinence, representing the first and second response options, respectively [26]. The item scores range from zero to three points for both types of incontinence. The total score ranges from zero to 26 points for either stress or urge urinary incontinence. Values between 13 and 26 points for urge urinary incontinence and zero to six for stress urinary incontinence indicate a 97% probability of an urge incontinence diagnosis. On the other hand, values between 13 and 26 points for stress urinary incontinence and zero to six points for urge urinary incontinence show an 87% probability of a positive diagnosis of stress urinary incontinence [26]. One of the characteristics of the Gaudenz-Fragebogen is that it is self-administered. It is easy to administer, with a mean time of 16 minutes for completion [26], and is designed for the hospital setting.

DISCUSSION

Regarding assessment tools for diagnostic evaluation of urinary incontinence in adults, this review revealed various tools for evaluating the severity, type, symptoms and impact of urinary incontinence. We have found six tools that measures the severity of urinary incontinence symptoms and not the diagnostic evaluation of urinary incontinence in adults. As is the case of the following tools: The St. George urinary incontinence score (SGUIS); The Urogenital Distress Inventory (UDI) and Incontinence Impact Questionnaire (IIQ**);** The Leicester Urinary Symptom Questionnaire (LUSQ): The Female Urinary Symptom Score (FUSS) and The Danish Prostatic Symptom Score (DAN-PSS) questionnaire. However, they are not specific in differential diagnosis, are focused on assessing the severity of symptoms of urinary incontinence. Those tools were designed for the hospital and community settings, most of which were self-administered.
The, Gaudenz-Fragebogen tool is a specific instrument for the female population, hospital setting and for a specific type of urinary incontinence. This one has the advantage of being self-administered and short duration of application.
Curiously, a important aspect that did not emerge from this review was the physical evaluation of adults., So, we believe that in recent years, research has focused more on the therapeutic attitudes within the impaired urinary incontinence than on the diagnostic evaluation of urinary incontinence. However, in our opinion, the early identification of people with involuntary urine loss and the differential diagnosis of urinary incontinence are essential to successful nursing interventions. These interventions should be targeted and individualized to the type of incontinence to result in health gains for the population.
More, the evaluation tools can help to systematize the diagnostic activity and consequently facilitate the nursing clinical practice in the field of urinary incontinence.
Lastely, in care conception, nurses should target their interventions to personal data to address individual symptoms and use assessment tools that can help in the differential diagnosis of UI. Then, to advancing the quality and rigor of nursing care, we advocate that providing nurses with skills in attaining a differential diagnosis of UI presents an added value to the

TABLE 1

FRAMEWORK TABLE FROM DATA ITEMS SELECTED IN THE INCLUDE STUDIES

AUTHORS (YEAR) AND COUNTRY	SETTING	DESIGN	AIMS	
Dowd, Kolcaba, & Steiner (2000) EUA	Community	Experimental	Test the abilities of cognitive strategies to augment the effects of an educational programme designed to treat compromised urinary bladder syndrome.	
Grupo Cordobés para el Estudio de la Incontinencia Urinaria (2003) SPAIN	Community	Non - experimental	To analyse the results of a year´s UI programme at Cabra Health Centre.	
Hines, *et al.* (2007) EUA	Community	Non - experimental	To assess factors predictive of high adherence to a behavioural intervention to prevent UI.	
Jonhson, Ouslander, Uman, & Shnelle (2001) EUA	Community	Non - experimental	To identify preferences for different UI treatments in LTC from groups likely to serve as proxy decision makers for LTC residents.	
Booth, Kumlien, Zang, Gustafsson, & Tolson (2009) SWEDEN	Hospital	Qualitative	To explore nurses' practices and influences in relation to UI following stroke in the UK, Sweden and China.	
Kim J. (2004) COREAN	Community	Quasi -experimental	To develop and evaluate IIPE on PFM exercise adherence and pelvic muscle strength.	

	PARTICIPANTS	RESULTS	EVIDENCE LEVEL
	31 female 9 male	Bladder educational and behavioural therapies influence the comfort of persons with urine loss to the extent that they decrease the frequency. These measures facilitate self-recognition of bladder dysfunction, decreasing the involuntary loss of urine. 1. Over time, the average scores of comfort on the UIFCQ differed between the intervention and control groups [F (2, 37) = 4.55, p = 0.02]. Specifically, the intervention group had a higher average comfort at Time 2:03 than the control group. 2. In total, 89.5% of subjects in the intervention group showed improvement in UIFCQ compared to 52.4% in the control group (p = 0.01). 3. When participants in the control group received the intervention (Cognitive strategies) at time 4, they showed the same improvement in level of comfort as the intervention group. 4. When the control group received the intervention, controls showed the same improvements in the level of urinary symptoms as the intervention group.	IIa
	40 female 1 male	The programme covered 4% (41 people) of incontinent patients. The mean time of development until consultation was 7.4 years. Mixed UI was the most common diagnosis (51%). The severity was moderate/severe in 39 cases. UI prevented 10 people from undertaking physical activities and affected 11 people´s relationships with their partner. Twenty-five people showed negative feelings, and 24 wanted an operation. Twelve people had no involuntary passage of urine at the end of rehabilitation, and 7 had none after a longer follow-up. The rest had positive changes in severity, state of mind, use of protective items and wish for an operation. The results were acceptable or successful for the people treated. The programme required an hour a week of doctor´s time and three hours of nursing time.	III
	164 female	Community-dwelling, postmenopausal women underwent PFMT and BT were followed, completing surveys for 1 year. Content analysis of open-ended responses was used to code the descriptions of approaches participants used to incorporate PFMT into daily life. Exploratory bivariate and logistic regression analyses determined the predictors of approach used and adherence. The results indicate that women incorporated PFMT into their lives using either a routine or ad hoc approach. Those using a routine approach at 3 months were 12 times more likely to adhere (odds ratio [OR] = 12.4, confidence interval [CI] = 4.0 - 38.8, $p < .001$) at a high level at 3 months and significantly more likely to maintain that level 12 months post-intervention (OR = 2.7, CI = 1.2 - 6.0, $p < .014$). Practicing BT was related to high adherence.	III
	403 family members of incontinent NH residents were mailed surveys. 66 nursing staff caring for 79 older adults were assessed.	Although there was wide variation within and between groups regarding preferred UI treatment, most respondents preferred non-invasive strategies (diapers and PV) to invasive strategies (indwelling catheters and electrical stimulation). Older adults preferred medications and electrical stimulation to a greater degree, therapies directed at the underlying cause of UI. Despite data documenting that diapering is a less time-intensive way of managing UI and that toileting programmes are difficult to maintain in LTC, nurses viewed PV as "natural" and strongly preferred it to diapering. Several family members and older adults viewed PV as "embarrassing" and "fostering dependence." These data highlight the need to identify preferences for UI treatment among LTC residents and their families.	III
	30 nurses	Nurses reactively manage urinary incontinence following stroke, adopting a routinized approach based on local custom and practice. Promotion of urinary continence is not a priority area of stroke rehabilitation for nurses in Western or Eastern countries. The consequence of conducting only superficial assessments was a lack of systematic identification of types or causes of urinary incontinence and a lack of individualised plans. A process model of practice, common to all three countries, was identified for stroke survivors with urinary incontinence. Routine core activities were followed by the palliative pathway (most frequently), in which urinary incontinence was contained to protect stroke survivors' safety and ensure social continence, or the rehabilitative route (more rarely), in which simple continence-promoting activities were implemented with the purpose of facilitating recovery of bladder function.	
	30 female	The average attendance was 6.2 sessions. The IIPE significantly improved PFM exercise adherence, intra-vaginal contraction power and CSE. However, it did not significantly affect incontinence stress or geriatric depression. Other important results were that the two-finger test and urine stream interruption were more useful for teaching and evaluating elderly women with rigid vaginas.	IIb

TABLE 1

Karon, (2005). NEW ZEALAND	Hospital	Non – experimental (Pilot Study)	To assess the effectiveness of a bladder retraining programme using behavioural therapies in reducing episodes of urinary incontinence and improving symptoms.	
Dougherty, et al. (2002) EUA	Community	Experimental - RCT	To implement and evaluate BMC, an intervention to manage symptoms of UI with older rural women in their homes.	
Diokno, et al. (2010) EUA	Community	Experimental - RCT	To determine the effectiveness of Group BMP in managing female UI, using a standardized protocol taught to adult incontinent women.	
Sampselle, et al., (2000) EUA	Community	Non - Experimental	To test the effectiveness of an evidence-based protocol for UI in improving the identification of women with the condition and improving their outcomes.	
Aslan, Komurcu, Beji, & Yalcin, (2008) TURKEY	Community	Experimental - RCT	To determine the efficiency of BT and Kegel exercises for older women living in a rest home.	
Reganhan, Guirardello, & Lopes (2012) BRASIL	Hospital	Methodological	To describe the process of translation and adaptation to the Brazilian culture of the Gaudenz- Fragebogen.	

Legend: UIFCQ - Urinary Incontinence Comfort Questionnaire; PFMT pelvic floor muscle training; BT – Bladder training; LTC - Long-term care; PV - Prompted voiding; IIPE - Incontinence Intervention Program for the Elderly Women; PFM - pelvic floor muscles; CSE - Continence Self-Efficacy; BMC - Behavioural management for continence; BMP - Behavioural modification program; TG - Treatment Group; CG - Control Group; BT - Behavioural therapy

	34 female 16 male	The findings showed improved urinary symptoms and improved quality of life based on an analysis of the Kings Health Questionnaire. There were statistically significant reductions in nocturia and episodes of urinary incontinence as well as an increase in the mean amount of urine voided in millilitres. Bladder retraining had no impact on the frequency of urination and no significant difference with regards to fluid intake. A telephone reminder did not provide a useful tool in improving outcomes. The 3 months of bladder retraining had a long-term impact and may be a valuable strategy for reducing the impact of urinary incontinence in a homebound adult population.	III
	BMC= 94 Control=84	The intervention involved self-monitoring, bladder training, and pelvic muscle exercise with biofeedback. The primary outcome variable, severity of urine loss, was evaluated by pad test. Secondary variables were episodes of urine loss, micturition frequency, voiding interval, quality of life, and subjective report of severity. Urine loss severity at baseline did not significantly differ between the two groups. However, using generalized linear mixed model analysis, at the four follow-ups, severity of urine loss, episodes of urine loss, quality of life, and subjective report of severity were significantly different. At 2 years, in the BMC group, UI severity decreased by 61%; severity in the control group increased by 184%. Self-monitoring and bladder training accounted for most of the improvement.	Ib
	Control=18 Treatment=23	Baseline data for both groups showed no statistically significant differences except for an age difference. At 6–8 weeks post-intervention, a significantly higher proportion of the TG (52.2%) had improved compared to the CG (16.7%). Additionally, the TG showed statistically significant improvement in 24-h voids, reduced leak diameter on cough test, improved pelvic muscle strength in pressure score, displacement, and duration, compared to their baseline pre-intervention data. The CG had only a statistically significant change in displacement score. Group-session teaching of BMP by trained urology nurses reduced UI severity, increased pelvic floor muscle strength, and reduced voiding frequency. This pilot study may precede the establishment of a single-session Group BMP as both a preventive and therapeutic cost-effective broad-based programme in the future.	Ib
	Continent=632 Incontinent=842	These results demonstrate the effectiveness of the evidence-based protocol in actual clinical settings. Frequency of incontinence episodes, estimated volume lost per episode, and the cost of self-management decreased. Quality of life improved, as reflected in decreased bother due to incontinence and in the number of women avoiding activities such as shopping, exercising, or travel because of incontinence. This simple programme of pelvic floor muscle and bladder training, systematically implemented in a variety of ambulatory women's health care settings, benefited women's continence status. The results of this project strongly support widespread application of the protocol.	III
	Control=25 Treatment=25	Behavioural therapy can be easily used as an effective treatment for urinary incontinence in elderly women living in a rest home. The average age of the treatment group was 78.88 ± 4.80 years, and the average age of the control group was 79.44 ± 5.32 years. Urgency, frequency and nocturia were common complaints. Pre-treatment, 8-week and 6-month evaluations revealed that the amount of urinary incontinence with urgency, frequency and nocturia complaints significantly decreased in the treatment group compared to the control group. In the pad test results, a statistically significant decrease was observed in the treatment group compared to the control group. A significant increase in pelvic floor strength was observed in the treatment group compared to the control group at all evaluations.	Ib
	35 female	The application of the Gaudenz-Fragebogen allows for the establishment of a differential diagnosis of female urinary incontinence. The score ranges from zero to three points for both types of incontinence. The total score ranges from zero to 26 points for either stress urinary incontinence or urge urinary incontinence. Values between 13 and 26 points for urge urinary incontinence and zero to six for stress urinary incontinence indicate a probability of 97% for a diagnosis of urge incontinence. On the other hand, values between 13 and 26 points for stress urinary incontinence and zero to six points for urge urinary incontinence show a probability of 87% of a positive diagnosis of stress urinary incontinence.	III

improvement of quality of care in a multidisciplinary context.

CONCLUSION

This integrative review contributes to knowledge in the nursing field, specially in care conception by identifying non-pharmacological interventions for adults with urinary incontinence as well assessment tools for diagnostic of urinary incontinence in adults.

All twelve studies were unanimous in considering UI as a public health problem based on its implications for individuals' daily lives and social activities. Nurses were reported to be an important professional group for the early detection of this problem as well as for implementing effective interventions. The non-pharmacological interventions identified are in the autonomous nursing interventions domain, namely, teaching, instructing, training and informing, as follows:

- Teaching, instruct and-training on pelvic muscle exercises.
- Inform about absorbent products.
- Inform on behavioural changes (reduction of caffeine intake, fight against overweight and regulating the amount and timing of fluid intake).
- Training behavioural therapies, namely bladder training and prompted voiding training.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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